

Appl. No. 09/608,976
Amdt. dated December 16, 2003
Reply to Office Action of October 17, 2003

REMARKS

In the Office Action dated April 24, 2003, claims 1-6, 9-22, 30, 31, and 34-41 were rejected under 35 U.S.C. § 103 over U.S. Patent No. 5,857,180 (Hallmark) in view of U.S. Patent No. 6,434,545 (MacLeod); claim 23 was rejected under § 103 over MacLeod in view of U.S. Patent No. 6,289,334 (Reiner); claims 24-27 and 29 were rejected under § 103 over MacLeod in view of Reiner and U.S. Patent No. 6,067,542 (Carino); and claims 7, 8, 32 and 33 were rejected under § 103 over Hallmark in view of MacLeod and Reiner.

Independent claim 1 was rejected over the asserted combination of Hallmark and MacLeod. The Office Action conceded that Hallmark fails to disclose the following elements of claim 1:

- displaying the steps of a query execution plan (for a parallel database system) in a graphical user interface;
- depicting parallel execution of steps of the query execution plan in the graphical user interface;
- wherein depicting the parallel execution of steps comprises displaying plural elements corresponding to concurrently executing plural steps on respective processors of the parallel database system.

The Office Action relied upon MacLeod as disclosing the elements missing from Hallmark. MacLeod fails to teach or suggest any of the elements of claim 1. In response to the Applicant's previous arguments, the current Office Action stated that "MacLeod specifically teaches a GUI to display the parallel query execution plan in form [sic] of tree structure [e.g., col. 8, lines 7-12; col. 8, lines 60-col. 9, line 4; Fig(s) 5-9]." 10/17/03 Office Action at 15-16. The error made in this statement is that the cited passages clearly do not teach or even remotely suggest displaying steps of a query execution plan (for a parallel database system) in a graphical user interface, and depicting parallel execution of steps of the execution plan in the graphical user interface by displaying plural elements corresponding to concurrently executing plural steps on respective processors of the parallel database system. Figures 5 and 6 of MacLeod, which are related to the passages

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cited by the Office Action, clearly illustrate the point that MacLeod does not teach or suggest displaying or depicting parallel execution of plans in a graphical user interface. Figure 5 of MacLeod displays two different query plans for two different queries, not parallel execution of steps of the query execution plan. *See* MacLeod, 7:13-16 (Figure 5 depicts a user interface that shows graphical analysis of *two* specified queries). Figure 6 of MacLeod depicts a user interface that shows graphical analysis of one specified query with multiple operations. MacLeod, 8:29-32. Although the display of the tree structure 210 of Figure 6 represents an execution plan that has operation node icons 211 to represent different operations of the execution plan, the displayed tree structure 210 does not display plural elements corresponding to concurrently executing plural steps on respective processors of the parallel database system.

Because neither Hallmark nor MacLeod teaches or suggests either the displaying or depicting acts recited in claim 1, their hypothetical combination also fails to disclose or suggest the elements of the claim 1. For at least this reason, a *prima facie* obviousness rejection has not been established with respect to claim 1.

In response to Applicant's previous arguments that there was no motivation or suggestion to combine the teachings of Hallmark and MacLeod, the Office Action replied by stating that the motivation and suggestion lies in the fact that a user "can use the GUI [of MacLeod] to monitor, compare, select, and create most efficient query execution plan as desired." 10/17/03 Office Action at 16. However, this statement fails to provide any rationale regarding why any person of ordinary skill in the art would have been motivated to modify the GUI of MacLeod to display and depict parallel execution of steps of a query execution plan for a parallel database system. Without the impermissible hindsight benefit of the present invention, a person of ordinary skill in the art looking only at the teachings of Hallmark and MacLeod would not have been motivated to provide a GUI to display and depict parallel execution of steps of an execution plan for a parallel database system.

For this additional reason, a *prima facie* case of obviousness has not been established with respect to claim 1.

Independent claim 30 is allowable over the asserted combination of Hallmark and MacLeod for similar reasons.

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Independent claim 11 was also rejected as being obvious over Hallmark and MacLeod. The Office Action cited to column 6, lines 11-54, of Hallmark as disclosing the first two acts of claim 11, namely determining a first execution plan of *the query* under a first condition, and determining a second execution plan of *the query* under a second condition. The cited passage of Hallmark does *not* disclose determining plural execution plans of the *same* query. For this reason alone, the obviousness rejection with respect to claim 11 is defective.

Moreover, the Office Action cited to Figures 5 and 6 and corresponding text of MacLeod as disclosing the displaying act. In citing MacLeod as disclosing the displaying act, the Office Action does not address how MacLeod teaches or suggests displaying first and second query execution plans of the *same* query under first and second conditions. As noted above, Figure 5 of MacLeod shows two query plans for two queries, not for the same query. For this additional reason, the obviousness rejection of claim 11 is defective.

In view of the foregoing, it is respectfully submitted that the asserted combination of Hallmark and MacLeod does not teach or suggest the invention of claim 11.

Independent claim 23 was rejected as being obvious over MacLeod and Reiner. As conceded by the Office Action, MacLeod does not disclose a controller to determine an execution plan of a query based on emulation data that emulates an environment of a target system in which a parallel database system is implemented. Rather, the Office Action cited to column 31, lines 1-14 of Reiner as disclosing this element of claim 23. Applicant respectfully disagrees that Reiner discloses the missing element. First, Applicant notes that claim 23 recites determining an execution plan of a query based on emulation data that *emulates an environment of a target system in which a parallel database system is implemented*.

The cited passage in Reiner describes a set of routines (UPI) that emulates the calling sequence and behavior of UPI routines. The cited passage also discusses combining results to emulate the result of an original query. Thus, two emulations are referred to in column 31 of Reiner, emulating a calling sequence and behavior of a set of routines (the UPI routines), and emulating the result of a query. There is no teaching

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whatsoever in Reiner of emulating an environment of a target system in which a parallel database system is implemented.

Although column 31 of Reiner also refers to POPI (parallel ORACLE program interface) routines, such POPI routines do not *emulate* an environment of a target system in which a parallel database system is implemented. As stated by Reiner, the POPI routines behave as a client with respect to additional servers to which the POPI routines connect from parallel threads to process parallel subqueries. This behavior of the POPI routines does not constitute the emulation of an environment of a target implementing a parallel database system. Therefore, even if MacLeod and Reiner can be properly combined, the hypothetical combination does not teach or suggest the invention of claim 23.

Dependent claims dependent from the independent claims of the present application are allowable for at least the same reasons as the corresponding independent claims.

Moreover, with respect to claim 3 (which depends from claim 1), the Office Action cited col. 7, lines 1-19, of Hallmark as disclosing determining steps of a query execution plan for a parallel database system running in a platform having *plural virtual processors* to handle access to data in the parallel database system. The cited passage does not refer whatsoever to determining steps of a query execution plan for a parallel database system having *plural virtual processors*.

With respect to dependent claim 17, which depends from claim 16 (which in turn depends from claim 11), the Office Action cited to col. 6, lines 32-42, of Hallmark as disclosing the determining acts performed by claim 17. Note that claim 17 recites determining the first execution plan for a query in cooperation with a first version of a software module of a parallel database system, and determining the second execution plan for a query in cooperation with a second version of the software module of the parallel database system. The column 16 passages cited by the Office Action makes no mention whatsoever of developing different execution plans for different versions of a software module.

With respect to dependent claim 19 (which depends from claim 18, which in turn depends from claim 11), the Office Action cited to col. 16, lines 53-61, of Hallmark as

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disclosing the determining acts recited in claim 19. Claim 19 recites determining the first execution plan for a query in a system having a first arrangement, and determining a second execution plan for a query in a system having a second arrangement. The cited passage in column 16 makes no mention of determining two execution plans for two arrangements of a system.

With respect to claim 21, the Office Action cited to Figure 6 of MacLeod and col. 17, lines 16-23, of Hallmark as disclosing the determining acts of claim 21. Applicant respectfully disagrees, as the cited portions of MacLeod and Hallmark do not disclose or suggest determining a first execution plan that involves a table having a first content, and determining a second execution plan that involves *the* table having a second content.

Dependent claims 7, 8, 32, and 33 were rejected as being obvious over the asserted combination of Hallmark, MacLeod, and Reiner. Reiner was relied upon as disclosing the following feature of claim 7: determining steps of a query execution plan by an optimizer based on *emulated environment data of a target system that comprises a parallel database system*. As discussed above in connection with claim 23, Reiner fails to disclose emulation of a target system that includes a parallel database system. Therefore, the hypothetical combination of Hallmark, MacLeod, and Reiner fails to disclose or suggest the subject of claim 7.¹

Claims 8, 32, and 33 are similarly allowable over the hypothetical combination of Hallmark, MacLeod, and Reiner.

In view of the foregoing, all claims are in condition for allowance, which action is respectfully requested. The Commissioner is authorized to charge any additional fees, including extension of time fees, and/or credit any overpayment to Deposit Account No. 50-1673 (9020).

¹ Moreover, the other elements of claim 7 (which depends from claim 6, which in turn depend from claim 1) are not taught or suggested by the hypothetical combination of Hallmark, MacLeod, and Reiner, based on Applicant's discussion with respect to the rejections over Hallmark and MacLeod.

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